The Bulletin
OF THE
South Indian Medical Union.

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The Bulletin OF THE South Indian Medical Union.

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The South Indian Medical Union

PROGRAMME

FOR NOVEMBER 1932.

Monday, 14th November ...	GOVERNING BODY MEETING	6-30 p.m.
„ 21st „ ...	CLINICAL MEETING	6-30 p.m.

PROPRIETARY FOODS AND THEIR ABUSE

BY

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BULLETIN

OF THE

SOUTH INDIAN MEDICAL ASSOCIATION.

OCTOBER 1932.

The Government General Hospital

Annual Report for the year 1931.

The reports of the State Hospitals in the Presidency are issued annually by the Surgeon-General in one volume. The Government General Hospital is an exception to this. Due to its importance and size, it enjoys the unique-privilege of issuing a separate report of its working. This hospital is considered to be the central institution to which patients resort from all over the Province. And as an institution responsible for the practical training of a large number of the medical practitioners of the province, its report is expected to be instructive and informing.

The bulk of the report is formed of the detailed tabulation of the varied work done in the different sections of the hospital. A comparison of this report with one of twenty years ago would show the number of new departments which have been opened and the growing number of patients handled by them. The Skin department is the latest addition. With the addition of these activities, the staff has increased to a certain extent, but not in anything like reasonable proportion to the large increase in the number of patients attended to.

The people who have been treated in the hospital are classified into two groups, European and non-European. It is rather a curious terminology for India. In some places in the same report, the patients are grouped as Indian and European as instanced by the special quarters for Indian officers and European officers. This is certainly a more sensible classification than the one generally adopted in this report.

Coming to the professional report, we must confess to a feeling of disappointment. It follows the usual lines, ranging from a small sheet of bare statistics to pages of ineffectual case reports. In the report of an institution of its size and reputation one expects to find a discussion of the peculiar grouping of cases, variation of types, special methods of diagnosis and investigations introduced or attempted, or a record of new lines of treatment and their results. It is in vain that we look for anything of the kind. It is propable that the organisation of the hospital is responsible for such poor reports. It is highly desirable that the authorities of the hospital should devote some thought towards this question. We regret very much that the reports of the two honorary physicians are conspicious by their absence. We hope very much that they would take the necessary trouble to furnish reports of their work in the future years.

This hospital is a great teaching institution. The only reference to this aspect in the report is the mention of the number of students that has worked there during the year. Surely, more space could have been devoted to this aspect with great advantage. We consider that the occasion of the writing of the yearly report should be utilized for a brief review of the teaching of medicine in the hospital.

There does not appear to be any definite plan in the designation of the various medical officers attached to the hospital. Medical officers in charge of special departments are evidently at liberty to style themselves as they like best. One subscribes himself as professor, another as lecturer, a third as a specialist and a fourth as surgeon-in-charge. A certain uniformity of designation would be an improvement.

GENERAL NOTES.

The report of the Government X-Ray Institute for the year 1931 is an interesting document. We congratulate the Institute on its successful enterprise of in incorporating X-Ray proof bricks in its new building. There is poignant grief implied in the report that the talents of the physicists and the medical men on its staff should be almost wholly taken up by the common routine work. This leaves them hardly any time for research for which presumably the staff is eminently fitted. The appointment of a few skilled technicians might probably be a very useful change in this place.

* * *

We are glad to note that the Institute is extending its activities in other directions besides Radiology. Medical Officers of the General Hospital and outside cannot be too grateful for the tip about the therapeutic virtues of lipiodol. Now that their attention has been drawn to this very useful fact, we are sure that medical men would take full advantage of this drug, of which we hope that the institute carries a good stock.

* * *

There is a paragraph in the report which might excite the envy of advertising firms. The authorities are evidently alarmed at the great fall in diathermy and high frequency sittings —there has been a reduction of about 3,000 sittings in 1931 as compared with 1928. It is very strongly recommended that diathermy should not be omitted in the treatment of certain injuries. It is further mentioned that "certain joint affections of the non-suppurating type which defy treatment by *drugs* improve by a combination of *diathermy, ionic medication and massage*" (italics ours). This has the true ring of the melody of the vendors of "pea-cock oil" (*mayil ennai*) !

* * *

We invite the attention of our readers to the communication published in this issue from the International Society of Microbiology. Some of the most eminent scientists of the world are associated with this organization. Medical men are generally keenly interested in the subjects which are the concern of this Society. We trust therefore a large number of our readers would enrol themselves as members of this new Society.

UNION NOTES.

A meeting of the Governing Body of the Union was held on Monday, 3rd October 1932, at 6-30 p.m., the following business was transacted :

1. The applications for admission of the following members were considered and the Governing Body was pleased to approve of their admission as members of the Union.

(1) Dr. P. Natesan, M.B. & B.S., Honorary Clinical Assistant, the Government Royapuram Hospital.

(2) Dr. V. Rajan, M.B. & B.S., Honorary Clinical Assistant, the Government Railway Hospital.

(3) Dr. S. Rajagopalan, L.M. & S., Honorary Assistant Dermatologist, General Hospital.

(4) Dr. M. Krishnamurthy, M.B. & B.S. Honorary Assistant Surgeon, Government Royapuram Hospital.

(5) Dr. M. Seetharama Rao, M.B & B.S. Honorary Assistant Surgeon, General Hospital.

(6) Dr. T. K. Narayanan, L.M.S., L.O., Honorary Assistant Surgeon, Govenment Hospital, Tellicherry.

(7) Dr. E. M. Sastry, M.B. & B.S., M.R.C.S., L.R.C.P., Bhagirathi Dispensary, Maharampet, Vizagapatam.

(8) Dr. S. Somasundaram, L.M.S., Honorary Assistant Surgeon, Government Hospital, Madura.

2. The resignation Dr. R. R. Adiga was accepted.

3. Consideration of Letter from Dr. N. D. Gopal Rao, L.M.P., regarding rules governing issue of medical certificates by registered practitioners to clerks of the Postal Department.

BULLETIN

OF THE

SOUTH INDIAN MEDICAL ASSOCIATION.

OCTOBER 1932.

The Vegetative Nervous System in Surgery.*

BY C. R. KRISHNASAMI, M.B., B S.

What is vegetative nervous system? It is a highly complex system of ganglia, nerve fibres and nerve plexuses. It innervates the involuntary organs, the pupil, the various glands and viscera, the heart and blood vessels and the genital organs.

Langley divides this system into two great subdivisions for anatomical, physiological and pharmacological reasons, *viz.*, the Sympathetic and the Parasympathetic.

Anatomical reasons.—The sympathetic system or the ortho-sympathetic consists of two chains of ganglionated cords situated on either side of the vertebral column extending from the atlas to the coccyx. The ganglia in each of these cords correspond to the spinal roots except in the cervical region where instead of eight ganglia there are only three ganglia, *viz.*, the superior, middle, and inferior ganglia. Further there is also this difference, that while the ganglia in the thoracic, lumbar and sacral regionsare connected with the corresponding spinal nerves, the three ganglia in the cervical region, are not connected with the spinal roots of the cervical nerves, but to the 1st and 2nd thoracic roots. The connections from the sympathetic chains to the cerebro-spinal system are called *rami communicantes*. Some of these *rami* are white or medullated and the others are grey or non-medullated. The white *rami* are mainly efferent. They arise from the intermedio-lateral region of the cord. These, though belonging to the vegetative nervous system, do not reach their distribution in the periphery directly, but only by the intervention of the ganglion cells. Hence the white *rami* are termed the pre-ganglionic fibres. The impulses from the central nervous system which are relayed at the multipolar nerve cells of the ganglia, are hereafter carried by the axons of the ganglion cells which are called the post-ganlionic fibres. The post-ganglionic fibres are non-medullated. The *grey rami*, originating as they do in the sympathetic chain are non-medullated and enter at once into the spinal nerves through which they are conducted to their distribution in the periphery, *i.e.*, the blood vessel and the non-striped muscles of the hair follicle, within the territory of the controlling spinal nerve.

The parasympathetic, on the other hand, does not form a chain like the sympathetic proper, but establishes connection with the cerebrospinal system at its upper and lower ends, *i.e.*, the cranio-bulbar centre and sacral. The wide extent of the spinal cord from the upper end of the cervical enlargement to the lower end of the lumbar enlargement, has no connection with the parasympathetic system. This system has its own corresponding *white rami* which is very long unlike the short *white rami* of the sympathetic. The *grey rami* or the non-medullated fibres of the parasympathetic are very short passing from the ganglia situated near the viscus to be supplied on to the viscus itself. To sum up the distinction between the two systems, the sympathetic has short preganglionic medullated and long post-ganglionic non-medullated fibres. The parasympathetic has long preganglionic medullated and short post-ganglionic non-medullated fibres. As examples of the *white rami* of the parasympathetic the following may be cited :—

* Paper read before the South Indian Medical Union, October 1932.

1. From the mid-brain along the oculomotor nerve to the ciliary ganglion.

2 From the medulla, along the nervous intermedius, glossopharyngeal and vagus to various ganglia like the sphenopalatine, otic and submaxillary.

3. From the sacral autonomic through the 2nd, 3rd and 4th sacral nerves to the colon, sigmoid, rectum, bladder and urethera and affording reflex paths to hollow organs which are periodically filled. These exert an intermittent phasic influence on these organs, in antagonism to the continuous, tonic or postural influence of the ortho-sympathetic.

Pharmacologically adrenalin increases the action of the sympathetic while Choline, physostigmine, and pilocarpine stimulate the parasympathetic fibres. The parasympathetic are paralysed by the drugs of the atropine group.

There is a further distinction in their function between the two systems. Stimulation of cervical sympathetic leads to the dilatation of the pupil, while the stimulation of the oculomotor leads to contraction of the pupil. Stimulation of the vagus (parasymathetic) leads to the slowing of the heart and stimulation of cardiac nerves, the true sympathetic, leads to accleration of the heart. The functions of the two divisions are antagonistic and in health a proper balance is maintained between the two systems.

The postganglionic fibre in parasympathetic is so short that it exists in the effector organ. Hence the stimulation of the parasympathetic leads to localized function response, whereas in sympathetic it leads to wide and diffuse reaction.

There is further psychological and metabolic distinction between the two systems. The sympathetic is the medium by which the defence mechanism of the body is stimulated, while the parasympathetic is the "nature's opiate" (Fraser) or in other words while the sympathetic is katabolic in effect, the parasympathetic is anabolic.

The order, in which the functional activities of the body are acquired, are contraction first, and inhibition later. The latter function is controlled by the parasympathetic which comes later in the chronology of evolution.

Individuals may be classified into two great vegetative types, according as their parasympathetic sensitiveness prevails over their sympathetic, or *vice versa*. The characteristics of the parasympathetic, or as he is otherwise called the vagotonic individual seeing that the vagus is the most predominant parasympathetic nerve, are that they are reserved, cold blooded with slow pulse, low blood pressure, contracted pupils, deepset eyes, cool pale skin, which sweats easily, and sometimes patchily, and also clammy hands and feet. The other evidences of excessive vagal activity are manifested in the form of gastric hyperacidity brady-cardia, asthma, and spastic constipation analogous to bronchial spasm. Parasympathetic individuals respond well to many surgical procedures. (The atonic sympatheticotonic cases do badly as a rule). Sugar tolerance is high in them. Such persons are also hypersensitive to vagal stimulation by vagotropic substances such as Pilocarpin (evidenced by bradycardia, ready sweating salivation nausea or vomiting) and to vagal depression by atropin. Vagotonic women sometimes have a masculine distribution of pubic hair, which instead of being bounded by a horizontal line, extends upwards along the linea alba towards the umbilicus.

The sympatheticotonic individual, on the other hand, with preponderating activity of the adrenals, is lively and excitable with rapid heart, bright eyes,

mobile and dilated pupils, rosy colour, deficient acidity of the gastric juice, and a warm dry skin (Purves-stewart).

We shall now consider the derangements that take place in the gastro-intestinal tract due to the sympathetic and parasympathetic imbalance. Every viscus is supplied by both the sympathetic and parasympathetic. There are exceptions to this rule. The oesophagus and the cardiac part of the stomach are supplied only by the parasympathetic, both motor and inhibitory impulses being conveyed by this channel alone. From the pyloric to the ilec-caecal region, there is both sympathetic and parasympathetic nerve supply. From here the large intestine up to the pelvic colon has pure sympathetic nerve supply. The rest of the colon and rectum have mixed nerve supply.

The pathological aspect.—Four types of derangement :—

(*a*) abnormal stimulus of contraction (spasm).

(*b*) exertion of inhibition on contraction leading to persistence of contraction (achalasia).

(*c*) exertion of inhibition on relaxation (atony).

(*d*) irregularity of the co-ordination between contraction and relaxation and possibly of inhibition (arrythmia).

Features of incidence :—

(*a*) The hypertrophies noticed in the early weeks or months following birth—so early as to be virtually congenital.

(*b*) From the 6th month to the 2nd year are noted those curious peristaltic disturbances which result in intussusceptions probally due partially to uneducated and misguided types of peristalsis.

(*c*) From the 2nd year onward to puberty no manifestations at all of any inco-ordination as though the education of whatever mechanism may have been at fault, has been completed.

(*d*) With the passing of puberty, the occurrence of spasms, achalasias, and atonies takes place, as though the adjustment is failing anew. A new type of pathology is now established (Fraser.)

THE INDIVIDUAL CONDITIONS.

Cardiospasm.—This is otherwise known as indiopathic dilatation of the lower end of the oesophagus. Histologically it was noted that in the oesophageal wall the Auerbach's nerve plexus was degenerated. Section of the vagus (parasympathetic) produced a similar result. As the maintenance of tone depends on the vagus, an ascending degeneration of the Auerbach's plexus may explain the enormous dilatation of the oesophagus. According to Hurst, in these cases the peristaltic wave is insufficiently strong to overcome the resistance of the cardiac sphincter. Owing to the long course of the disease, the oesophageal muscles, by overaction, may be hypertrophied and greatly dilated due to the acclumulation of food. The onset of symptoms is sudden, the first complaint being a feeling of discomfort behind the lower end of the sternum. The condition is frequently mistaken for a gastric disorder, but the history and the reaction of the ejected material, which is alkaline, should exclude this.

Congenital hypertrophy of the Pylorus or congenital pyloric stenosis.—The hypertrophy occurs in the muscular coat of the pyloric *canal* and the antrum of the stomach. The *sphincter* is not affected. The change involves that portion of the stomach which is concerned with the expulsion of its contents. There is an ill-timed

and abnormal, yet, forcible contraction of the stomach muscle and because of the incoherency of function, the contents are prevented from leaving the stomach. How could the muscular hypertrophy be accounted for? Because it has been worried from an early period of its developement by constantly recurring overaction such as would result from even a slight degree of inco-ordination. Such want of co-ordination actually begins before birth, when the activity of the stomach and pylorus is stimulated by the swallowing of Liquor amnii.

Pathology.—From the level of the pyloric veins, the muscular hypertrophy extends proximally along the stomach wall to the neghbourhood of the incisura angularis. The muscular and the submucous coats alone being involved in the hypertrophy, easy separation of the mucous from the overlying muscular coat, is thereby facilitated during the operation. The mucous membrane is invaginated in a U shaped manner into the lumen further increasing the obstruction (Fraser).

Ramstedt's operation offers the best chance of cure.

Hypertrophic ileal obstruction.—The segment involved is that immediately proximal to the actual ileal sphincter. This lesion occurs where the sympathetic and parasympathetic nerve supply ends and the parasympathetic supply starts. Laparotomy is not safe.

Hirschsprung's disease, or as it is otherwise known as congenital hypertrophy and dilatation of the colon. This is a malady where the lower end of the pelvic colon, an area purely supplied by the sympathetic, joins the rectum which has a mixed sympathetic and parasympathetic supply. The circular fibres of the rectum fail to relax harmoniously and thus the longitudinal fibres of the colon become hypertrophied and the gaseous contents of the colon produce the enormous dilatation. The lower limit of the area where the pathological change takes place is known as the pelvirectal valve or the O'Biren's sphincter. The hypertrophy involves both the longitudinal and circular fibres of the colon and the muscularis mucosae.

Broadly speaking, these processes are functional, *i.e.*, a delay in the acquisition of the power of inhibition by certain segments of the alimentary canal, segments which are proximal to sphincters, and which correspond to areas of different nerve supply.

The Arrthymias of early childhood.—Examples of this condition are the intussuseption which occurs in children from the 6th month to the end of the 2nd year. Three types of movements are present in the intestines.

(1) *Segmentation movement*—This is a local response.

(2) *True peristalsis*—In this there is a wave of inhibition preceding that of contraction.

(3) *The peristaltic wave*—Under certain conditions the peristaltic wave is very rapid and is called the peristaltic rush.

When the last mentioned type of movement takes place without the preceding wave of inhibition, intussusception is produced, because the rapid wave of peristalsis forces a bit of the gut into the unrelaxed portion of the bowel. Every child does not develop this error and it occurs only in those cases where there is a developmental error such as the non-fixation of the ileo-caecal segment into the posterior abdominal wall. The laxity of the attachment offers a mechanical explanation. Probably there is congenital deficiency of the nodal tissue in the ileo caecal segment.

The disorders of the adult life.—These disorders of the adult life which

originally started as a result of the nervous imbalance, are complicated by psychological and toxic factors. Imperfect attachment of the caecum and the ascending colon is a constant accompaniment of this functional disturbance.

Vascular System

We shall now consider the disturbances that take place in the vascular system. " It has long been known that the stimulation of the nerve fibres lying in the adventitia of an artery leads to a spasm of that artery, and Leriche, seeing the practical application of this fact, evolved his operation of periarterial sympathectomy. This he used for vasospastic conditions of the legs and arms, particularly Raynaud's disease and Buerger's disease (thrombo-angiitis-obliterans). He also applied it to such maladies as chronic varicose ulcers of the leg, delayed union of fractures and traumatic tuberculosis of joints,—conditions, he argued, wherin any improvement of the circulation would seem to promise a stimulus to the sluggish process of healing. This vasodilatation—for that is what the operation was calculated to produce—is found to be of temporary duration only lasting about 5 or 6 weeks, after which time the arteries would appear to regain their normal tone, so that, though of considerable help in the more local conditions such as the three last mentioned, in which a fuller blood supply of a few week's duration is sufficient to initiate a more vigorous healing reaction, the results are disappointing in the more generalised states such as Raynaud's and Buerger's diseases in which the improvement in the circulation needs to be lasting before permanent alleviation can be expected; the conception was good but the anatomy was incompletely understood" (Stammers).

Leriche's operation of periarterial sympathectomy was ineffectual as its effects were transient. The nerves that enter the adventitia at the beginning of the course of the vessel to the extremity, do not contain all that is needed for the entire innervation of the blood vessels in its whole course. There is a constant accession of nerve fibres to the vessels in the distal parts, these fibres being derived from the nerves to the voluntary muscles. The nerves in the adventitia of the femoral artery at the Scarpa's triangle innervate the blood vessels only up to the popiliteal. Below this the blood vessels get a further supply of nerve fibres from the nerve to the popliteus. So, if permanent vasodilatation is required one must attack the source. Therefore complete sympathetic denervation of the vessels of the lower extremity can only be achieved by removal of the 2, 3 and 4 Lumbar ganglion with the intervening chain on the appropriate side. Similarly for the upper extremity the extirpation of the inferior cervical ganglion, 1 and 2 dorsal ganglia with the intervening chain will bring about the denervation of the blood vessels therein.

Raynaud's disease, which is due to the overaction of the sympathetic, is relieved by sympathectomy; because of the release of the blood vessels of the sympathetic control, the spasms are obviated. But with Thrombo-angiitis-obliterans (Buerger's disease) the state of affairs is different. In this two different factors enter in its pathology, *viz.*, (1) the inflammatory lesion of the vessels resulting in a narrowing of the lumen and (2) a superimposed spasm. Sympathectomy is of use in this condition, only when the latter factor is of sufficient degree to influence the final pathology; for when there is an overwhelming narrowing of the blood vessel, the increase of blood circulating to the distal parts brought about by the abolition of the vasospasm owing to sympathectomy,

may not be enough to obviate the original symptoms complained of. How then can we determine whether a particular case of Buerger's disease will or will not be benefited by this operation? Yes, by the following method a laboratory thermometer is bandaged to the affected limb in such a manner that the bulb of the thermometer will be lying in contact with two fingers or toes. The temperature is noted in this bandaged thermometer and the temperature in the mouth of the patient is taken. An intravenous injection of 50 millions of T. A. B. vaccine is given and the height of the subsequent temperatures are noted both in the mouth and the limb. The temperature in the limb before the injection will be a little above the room temperature and any rise during the fever stage is due to the vasodilatation consequent on the relaxation of the sympathetic tone. Brown of the Mayo clinic has found from experience that if the difference in degrees between the rise of temperature in the mouth and that of the limb, is three times the rise in the mouth, then the case is suitable for operation. Thus if the rise of temperature in the mouth is 3° and that of the limb is 16°, the index becomes $\frac{16-3}{3} = 4{\cdot}3$ and the patient would receive great benefit. If the index is below three, it indicates that the thrombosis is responsible for the trophic changes to a much greater degree than the spasm. In Raynaud's disease the index may be as high as 10 or 20 (Stammers).

The approach for the removal of the inferior cervical and 1 and 2 dorsal sympathetic ganglia is from the back. The transverse processes of the first and second dorsal vertebrae and the corresponding head and neck of the ribs are removed and the ganglia are found lying in front on the pleura. The inferior cervical ganglion lies on the neck of the first rib and the first dorsal ganglion is fused with it. The second dorsal ganglion lies in front of the head of the second rib. The *grey* and *white rami communicantes* are seen to enter and leave the ganglion in a radiating fashion. If both sides are to be treated they are approached by a single median dorsal incision.

Spastic constipation of varying degrees are due to the overaction of the sympathetic, which supplies the circular fibres of the sigmoid. This condition is relieved by the excision of the Presacral nerve whereby the sigmoid is released from its sympathetic control which sympathetic control inhibits the peristalsis of the sigmoid. We shall now consider the innervation of the organs of the pelvis most especially the bladder and the rectum.

The sympathetic nervous supply for these organs is provided by the fibres coming from the 1 and 2 Lumbar ganglia of the sympathetic chain. These fibres are known as the lateral roots and are medullated. As these lateral roots converge, they are joined by a third or middle root, which is made up of postganglionic non-medullated fibres from the network of sympathetic nerves lying in close relation to the front and sides of the Aorta, known as the Intermesenteric plexus. These three roots unite to form a bundle and descend vertically down on either side of the middle line, crossing the left common iliac vein, to the front of the sacrum. This is what is known as the Presacral nerve. It divides into the two Hypogastric nerves, eventually synapsing at the Hypogastric ganglia. The detrusor muscle of the bladder is inhibited and the sphincter vesicae is stimulated.

As the Presacral nerve lies in front of the 5th Lumbar vertebra, in the angle of the bifurcation of the aorta, a definite branch, known as the 'Lumbar-Colonic' nerve, goes to the

rectum following the inferior mesenteric artery. This is the sympathetic nerve supply by which inhibition of the peristaltic movements of rectum is brought about.

The parasympathetic nerve supply for these organs is provided by the connector fibres from the anterior roots of the 2 and 3 sacral nerves uniting to form a single nerve, known as the nervi-erigens. They proceed to innervate the organs they are intended for, by synapsing with the ganglionic cells in the wall of the bladder and the rectum. The function of this nerve supply is to stimulate detrusor muscle of the bladder, *i.e.*, to empty the organ and to inhibit the sphincter vesicae. In a similar manner the colon and the rectum are made to contract and the sphincter ani externus is inhibited.

The surgical significance of the nerve supply will be fully appreciated if I quote the case narrated by Stammers. This was a female aged 22, who was admitted to the hospital with the complaint of obstinate constipation. She had a long history of medical and surgical treatment, *i.e*, appendicectomy and tonsillectomy and daily enemata etc. It was then decided to resect the Presacral and the Lumbar colonic nerves on the assumption that this was some form of achalasia. The abdomen was opened by a midline incision from the umbilicus to the symphsis and the patient put in the extreme Trendelenbergh position and the small intestines packed away. On the left side the peritoneum lateral to the descending colon was incised and the colon was reflected towards the middle line. The Lumbar Colonic nerve, the definite branch of the presacral nerve, going by the side of the inferior mesenteric artery was resected. The patient ever afterwards began to have easy movements.

The indication for the resection of the presacral nerve in bladder conditions can be fully appreciated by the narration of the case reported by Foulds of Toronto. This was a man aged 22 admitted to the hospital for the loss of bladder control for the last 15 months, after a fall from a height. There was a definite overflow incontinence at night, leading on to excoriation of his private parts. There was no definite paralysis of the lower limbs. In the discussion of this case I cannot do better than quote Foulds' own words. " The absence of any desire to urinate and an inability to urinate satisfactorily indicated interference with the sacral autonomic supply of the bladder. However, in view of the observation that by taking time for the relaxation of the sphincters and by the aid of the accessory muscles, partial emptying of the bladder was possible and that the power of erection had partially returned, it seemed reasonable to assume that there was not a total absence of impulses transmitted by the pelvic nerves, and that what really mattered was a lack of balance between the sympathetic and the sacral autonomic innervation, the sacral autonomic normally being the positive or active force, while the sympathetic acts as a brake. Now the brake seemed to be too strong for the continued action of the detrusors forces. Accordingly it was decided to interrupt the sympathetic innervation by resecting the presacral nerve and so remove the brake action."

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Diseases of the nervous system by Jeliffe.

"Applied Physiology" by Samson-Wright.

The International Society of Microbiology.

The International Society of Microbiology was established in 1930 with the object of promoting scientific thought by creating a closer relationship between scientific workers in different countries, and especially of spreading the idea that all its members are united in a common ideal of peace and constant friendship.

The Society is interested in all Microbiological Sciences (Medical, Agricultural, Botanical) : Bacteriology, Immunology, Parasitology, Zymology.

An International Congress of Microbiology is held every 3 years. A General Meeting is held at the end of each Congress. The permanent office of the Society is in Brussels.

The Society is directed by a Central International Committee and a permanent Commission. The Central Committee is composed of the members of the Society's Board, of the members of the permanent Commission and the Chairmen of the national Committees.

The members of the International Society are to form, in their respective countries, either a national Committee or Sectional Committees, who in turn elect a national Committee. The national Committees so constituted form a relationship with the Societies of Microbiology existing in these countries and the International Society of Microbiology.

The Board is composed of (1) the Chairman of the International Society, (2) two Vice-Chairmen appointed for 3 years by the Central Committee and (3) three General Secretaries, one for the German language, one for the English language and one for the French language.

The permanent Commission is composed of (1) the Chairman of the Belgian National Committee, (2) a member elected at the first general meeting who works as its Secretary, (3) a Treasurer, and (4) the Presidents of the last four Congresses. This Committee manages the property of the Society.

The members of the International Society are elected by the office of the Central Committee, after proposal by the National Committees. These proposals are transmitted to one of the 3 General Secretaries of the Central Committee. Any person who wishes, therefore, to join the International Society of Microbiology *must first address an aplication to the National Committee* of his country. The National Committee will then make its proposals to the Central Committee. The General Secretaries send a list of the members proposed by the National Committees of the respective countries every year to the members of the Board of the Central Committee who are to ratify the list within a period of 3 months.

After a proposal of the Central Committee, each General Meeting may appoint an honorary President and honorary members.

A General Meeting of the Society will be held every 3 years on the occasion of the International Congress organised by the Society, which will take place in the city selected by the preceding General Meeting.

The official languages used in the Congresses are English, French and German. The different subjects treated at the Congress are reports, communications and demonstrations.

The President, together with the Central Committee, determines upon the nature and the number of the scientific problems which are treated in the reports and chooses the Rapporteurs. They also decide upon the duration of the Congress, which is ordinarily 5 days.

The communications must treat the subjects decided upon for the reports. Published papers will not be accepted. The writers of reports and communications shall address to the Secretary of the Board of the Congress a resume of these reports and communications. These texts will have to be in the hands of the Secretary of the Board of the Congress 3 months before the opening of the Congress in case of reports and 2 months in case of communications. The writers of reports and communications are requested not to use any historical or literary introductions and to report only on new work. The time allowed to authors will not exceed 30 minutes for reports, 10 minutes for communications and 5 minutes for discussions. Those taking part in the discussion will have to send to the Secretary a summary of their statements on the day following them.

The first International Congress was held in Paris from 20th—25th July, 1930, under the presidency of Prof. Jules Bordet. The following countries, who had formed national committees in their respective countries, were represented :—Germany, North America, England, Argentine, Austria, Belgium, Brazil, Bulgaria, Chili, China, Denmark, Spain, France, Greece, Holland, Hungary, Italy, Japan, India, Norway, Poland, Portugal, Roumania, Sweeden, Switzerland, Czecho-Slovakia, U.R.S.S., Yugo-Slavia.

The second Congress will be held in Berlin in 1933. Geheimer Hofrat Professor Hahn, Director of the Hygiene Institute of the Berlin University, has been elected as the President. The following gentlemen are working as General Secretaries :—

1. Dr. R. Dujarric de la Riviere, of the Pasteur Institute, Paris.

2. Prof. Gildemeister, Reichsgesundheitsamt, Berlin—Dahlem.

3. Dr. Harry Plotz, Pasteur Institute, Paris.

The Treasurer of the Society is Mr. Georges Mason, Editeur, 120, Boulevard St. Germain, Paris (VIe).

The General Meeting which took place on the occasion of the first International Congress of Microbiology fixed the entrance fee at 20 gold francs (100 paper francs, 4 dollars or its equivalent in the various currencies). This sum is to be sent to the Treasurer of the Society, Mr. Georges Masson, Editor, 120, Boulevard St. Germain, Paris, *but only after receipt of notification by the* Central Committee that the person in question has been nominated a member of the International Society of Microbiology.

The following is a provisional list of subjects selected for discussion at the second International Congress to be held at Berlin in 1933 :—

1. Susceptibility to tuberculosis.
2. Tularemia.
3. Spotted fever and related diseases.
4. Significance of tissue cultures for microbiology.
5. The use of carbohydrates as antigens.
6. A subject from the Biochemistry of bacteria (to be shortly announced).
7. Helminthic research.
8. Symbiosis (for medical men and naturalists)
9. Parasitism among the higher plants.

The present Indian Committee is composed of the following workers :—

President :—Dr. U. N. Brahmachari, M.A., M.D., Ph.D., Physician, Medical College Hospitals (Ret.) and Director, The Brahmachari Research Institute, Calcutta.

Members :—Col. R. Row, M.D. (Lond.), D.Sc. (Lond.), O.B.E., Professor of Pathology, Grant Medical

College, Bombay. Major G. Shanks, M.D., I.M.S., Professor of Pathology, Medical College, Calcutta. Mr. V. Krishnamurti, G.M.V.C., I.V.S., Principal, Madras Veterinary College, Madras. Dr. K. Khanolkar, B.Sc., M.D. (Lond.), Professor of Pathology, Seth Gobardhandas Sundardas Medical College, Bombay. Dr. H. Ghosh, M.B., Director, Biological Department, Bengal Chemical and Pharmaceutical Works, Calcutta. Dr. A. C. Ukil,—Secretary, Professor of Bacteriology, National Medical Institute, and Director, Tuberculosis Research, Indian Research Fund Association, Calcutta.

Members who constituted the Society at the time of registration :—

Honorary Presidents.

Dr. E. Roux, Director of the Pasteur Institute, Paris.

Sir Almroth E. Wright, Professor, University of London.

Honorary Members.

Messrs. Richard Pfeiffer, Baron Shibasaburo Kitasato, William Welch, M. W. Beijerinck, A. Yersin, J. Winogradsky.

Members of the Central Committee.

Professor Martin Hahn (Germany), Simon Flexner (U. S. A.), J. C. G. Ledingham (England), Alosis Bachmann (Argentine), Roland Grassberger (Austria), Jules Bordet (Belgium), Carlos Chagas (Brazil), T. Petroff (Bulgaria), R. Kraus (Chili), WuLien-Teh (China), Thorwald Madsea (Denmark), D. Francisco Murillo (Spain), W.O. Streng (Finland), Albert Calmette (France), H. Aldershoff (Holland), Hugo Von Preisz (Hungary), U. N. Brahmachari (India), Serafino Belfanti (Italy), T. Kitashiwa (Japan), A. de Besche (Norway), I. J. Kligler (Palestine), Z. Szymanowski (Poland), N. de Bettencourt (Portugal), J. Cantacuzene (Roumania), M. I. C. Forssmann (Sweeden), George Sobernheim (Switzerland), Ivan Houl (Czecho Slovakia), J. L. Kritschewski (U. R. S. S.), G. Yoannovitch (N. Yugo Slavia).

Bureau of Central Committee
(Second Congress).

1. Geheimerhofrat Professor M. Hahn, President-elect of 1933 Congress at Berlin.

2 & 3. Vice-Presidents :—Geheimrat Professor Neufeld (Berlin) and Geheimrat Professor Fulleborn (Hamburg).

4 & 6. General Secretaries :—Dr. Dujarric de la Riviere, Professor Gildemeister and Dr. Harry Plotz.

N.B.—Any further information will be gladly furnished on request by Dr. A. C. Ukil, Secretary, Indian Committee of the International Microbiological Society, 82/3, Carnwallis Street, Calcutta.

APPENDIX.

The International Microbiological Congress is held every 3 years. The first Congress was held at Paris in 1930. The next Congress will be held at Berlin in 1933. Only those members who are recommended by the National Committees are eligible for membership of the International Society. The membership fee for the Indian National Committee is Rs. 6 only a year. The fee for membership of the triennial International Congress has been fixed at 4 dollars or its equivalent. Members of the medical profession or of the Biological and Veterinary Sciences who want to contribute papers or to become members of the International Society are requested to communicate with Dr. A. C. Ukil, Secretary to the Indian Committee, 82/3, Cornwallis Street, Calcutta, for further information.

EXTRACTS.

Medical applications of Anti-Colibacillary Serum.

H. Vincent, M.D.

Infections due to the B. coli are important not only by reason of their great frequency but also because many ill defined infectious states are due to this micro-organism.

B. coli may implant itself in almost any organ or tissue. In children it may cause grave septicaemia while in nursing infants grave suppurative pyelo-nephrits may result but escape recognition due to failure to examine the urine. It is a well recognized infecting agent of the urinary apparatus, the prostate and seminal vesicles and in the adult constipation and pregnancy are frequent underlying causes of suppurative coli-bacillary pyelo-nephritis both acute and chronic. Primary infection of the kidney and bladder with B. coli is very common and apt to escape recognition when slight.

The gravity of B. coli infection is not only because of the rapid proliferation of the organism in the blood and viscera but also on account of the toxins produced. These are of two kinds:

(1) a thermolabile exo-toxin affecting the nervous system, central, peripheral and sympathetic.

(2) a thermostable endo-toxin affecting the intestinal canal and the hepato-biliary apparatus.

Though cultural and morphological characteristics vary with different strains of the colon bacilus, all strains have this one property in common in a greater or lesser degree, that of secreting a neurotropic exo-toxin and an entero-and hepatotropic endo-toxin and close clinical observation reveals symptoms more particularly due to one or other of the toxins or to their association. In the later instance apart from the gastro-intestinal symptoms such as diarrhoea and jaundice, nervous manifestations more or less severe such as stupor, delirium, restlessness, late paralyses and psychasthenia are noticed.

These observations have resulted in the preparation of a therapeutic anti-bacillary serum both anti-infective and and anti-toxic in its action and its use has in numerous cases been attended with rapid and conclusive results.

Medical affections in which its use is indicated.

(1) *B. coli-septicaemia*—symptoms resemble those of typhoid fever without the rose spots and diagnosis is by blood-culture. Condition rapidly clears under 20—40 c.c. of serum injected daily. This condition sometimes follows severe physical overstrain.

(2) *Suppurative pyelo-nephritis* is one of the commonest localisations of coli-bacillosis and occurs in both children and adults and in pregnant women due to pressure of gravid uterus on the right kidney and intestine. Often very refractory, it yeilds quickly to serum treatment.

(3) *Disease of the gall-bladder and Liver.* Grave jaundice is sometimes due to B. coli cholecystitis and diagnosis is made by bacteriological examination of bile specimen obtained by duodenal drainage, serum gives quick results when urotropine and other remedies have failed.

(4) *Disorders of the Nervous system* —As already stated B. coli may produce nervous complications by its neurotropic toxin. It is quite possible that some cases of Landry's Ascending Paralysis in man are due to this toxin and experimental evidence in animals seem to support this. Clinically, the onset of paraplegia in renal subjects and as a late sequel of B. coli septi-

caemia have been observed. These facts are of interest as enabling us to understand nervous affections of indeterminate origin. No doubt Colibacilluria often supervenes in paraplegics but that B. coli infection may itself determine lesions of the spinal cord has to be recognized. Here also administration, of serum brings about recovery often in a very striking manner.

(5) *Gastro-intestinal disorders.*—In patients with B coli infection more or less gastro-intestinal disturbances are frequently met with. At the same time characteristic neuropathic reactions such as on the one hand visceroptosis, intestinal spasm and colic, diarrhoea alternating with constipation, mucous or bilious stools may be seen or on the other, excessive mental irritability alternating with periods of depression, incapacity for work, melancholia, refractory insomnia, headache neurasthenia or even psychasthenia merging into suicidal tendencies. That these morbid states are due to the double intoxication with the entero- and neuro-toxins of the B. coli has been amply verified since all symptoms of enteritis and the neuropathy have disappeared under serum treatment. A case is cited of a man diagnosed as "muco-membranes entero colitis" of 54 years' duration and in whom every remedy had failed and who presented a bad neuropathic state restored to normal health under serum treatment. The rapid disappearance of complex enteritic and neuropathic symptoms under serum treatment justifies the view that "chronic entero-colitis," also referred to as "mucous or muco-membranous colitis" should be regarded as a toxi-infectious disease, perhaps more toxic than infectious due to absorption in the large and small intestine of the two toxins secreted by innumerable colon bacilli that normally vegetate in the digestive tract. This enormous proliferation is inoffensive in the healthy subject since the liver, bile, pancreatic and intestinal secretions neutralise the toxins produced continuously and completely. Normally the bile is the chief detoxicating agent and the essential elements in the neutralisation are the normal soaps. Patients with chronic muco membranous entero-colitis have suffered from hepatic insufficiency and consequent inefficiency, especially qualitative, of the bile, the soaps not being present in their normal amount In such patients with hepato-biliary insufficiency the normal multiplication of the B. Coli becomes a danger especially as these are constipated since the soluble toxins produced are no larger neutralized but are continuously absorbed.

The following variable symptoms characterize such intoxication, pallor, subicteric hue or frank jaundice and tenderness of the liver and gall bladder. Spasm of the colon, colic, constipation or foetid diarrhoea are the result of the action of the neuro-toxin on the vagus and sympathetic while the action of the toxin on the central nervous system explains the neuropathic troubles. However attempts to demonstrate the coli-bacilary origin of the infection by agglutination, precipitation and complement-fixation reactions with the patients' blood have been inconclusive. The more important confirmation is however the rapid disappearance of all the intestinal and neuropathic disturbance under serum treatment.

Attention is also called to the probable coli-bacillary origin of certain dementias. A case is recorded of dementia praecox following B. Coli septicaemia. Another of a subject with obstinate constipation and urinary coli-bacillosis who presented symptoms of hypochondria with fugues, delirious mania, ideas of persecution and suicide together with well marked digestive disturbance and total loss of appetite,

who was completely cured after 6 injections of 40 c.c. each of anti-B. coli-serum

A plea is therefore made for the advisibility of determining the presence of a B. coli infection such for *e g.*, as inoculating an animal with the urine of the suspected case—in certain cases with various mental disturbances as well as investigating systematically the patient's antecedents with reference to previous grave persistent gastro-intestinal disturbances, appendicitis or even a septicaemic infection clinically resembling one of the typhoid fevers which may have been an unrecognized coli-bacillaemia.

The importance of commencing serum treatment as early as may be is stressed. As in diptheritic paralysis, once toxin is fixed to the nerve-centre, it may be irremediable. (*American Journal of the Medical Science March 1932.*)

The Treatment of Ovarian Disturbances with Urine of Pregnant Women.

(Dr. W. Schildberg Krupp's Hospital, Essex).

The treatment of ovarian disturbances with various hormone preparations is very often fruitless and besides so expensive that it hardly comes into consideration for most patients. Since the hormone of the anterior lobe of the hypophysis occurs so abundantly in the urine of pregnant women, the author has been treating ovarian disturbances since May 1931 with injections of the urine of such women and has had astonishing results. *Technique*: the morning urine of healthy pregnant women (tuberculosis and lues of the kidneys should be excluded) is secured in a sterile condition by means of catheter and examined for albumin and sugar. A few leukocytes

in the microscopic field can do no harm. A drop of phenolum liquefactum is added to each five c.c. of urine for purposes of disinfection and preservation. The author was able to keep urine prepared in this way up to eight days without noticing any signs of decomposition. The injections should be given every second to third day :

1st injection 0·5 c.c urine + 1. c.c. ¼% Novacaine solution.

2nd injection 1·0 c.c. urine + 1. c.c. ¼% Novacaine solution

3rd injection 1·5 c.c. urine + 1. c.c. ¼% Novacaine solution.

4th injection 2·0 c.c. urine + 1. c.c. ¼% Novacaine solution.

Then every further injection with 2 c.c. urine + 1 c.c. ¼ % Novacaine solution mixed in one syringe and given as an intramuscular injection. Among 400 injections given up to the present, no single injury has been observed, no infiltrations at the point of injection, no temparature increases. The injections are painless. In cases of amenorrhoea and oligo-menorrhoea 12 to 20 injections were necessary. In cases of hyper-menorrhoea and metrorrhagia, the author had to give only 6 injections in each case. In every case, he succeeded in bringing about a regular menstruation of normal character and the disappearance of the often severe symptoms. The results sometimes set in only after some time after the last injection. The author asks that this simple method be tested.

(*Ars. Medici—August 1932.*)

The Non-Surgical Treatment of Bronchiectasis.

(As outlined By Prof. Dr. Wilhelm Neumann, Vienna.)

The Surgical treatment of Bronchiectasis has good prospects only when we have to deal with a purely uni-

lateral, mostly left sided bronchiectasis in a young person so that we can have reason for thinking that there is some chance for a good outcome of the lobectomy of this diseased lobe. If the process is bilateral and the patient over 30 years not much can be hoped for from the surgical treatment, unless it happens, as is rarely the case, that a large sac-shaped, single bronchiectasis is present, which can be surgically opened from without like a gangrene and thus cured. Neither a phrenectomy, nor thoracoplasty, nor a filling of the lung can give a lasting satisfactory result.

We have therefore all the more to fall back upon internal measures. Unfortunately these too very often fail us. Not much can be expected from G. Singer's thirst cure, from Quincke's position with head hanging far down, from the administration of products containing balsam or guiaicum or creosote per os or as hypodermic treatment or intramuscular injection and this is especially true when it is impossible to keep the patient constantly in the purest mountain air or at the seashore and so prevent a fresh secondary infection of his bronchi.

In my opinion a good part of the cases of Bronchiectasis can be attributed to an old healed up tuberculosis and the bronchial deformation thus developed; in the course of time this broadens and widens through the softening of the bronchial wall and the mixed infections that always keep appearing. I therefore carry through a systematic tuberculin cure in every case, either hypodermically after the previouse valuation of tuberculin allergy by means of Mantoux's intradermal injections or as a percutaneous cure with my Atahan. With light cases of bronchiectasis, I have seen quite good results from this treatment.

Now such a cure is considerably supported by occasional disinfection of the bronchial tree. We have recently had two methods put at our disposal for this purpose. The one is the forced cure with high cacodyl doses as inaugurated by Veilchenblan. We administer every fourth day an intravenous injection of 50% sodium cacodylate in water beginning with 1 c.c., and increasing and decreasing in the following order: 1 c.c., 2 c.c., 3 c.c., 4 c.c., 5 c.c., 6 c.c., 5 c.c., 4 c.c., 3 c.c., 2 c.c., 1 c.c. The only unplesant part of the procedure is the troublesome strong odour of garlic in the breath, but as for any disagreeable symptoms of intoxication, these I have never seen; on the other hand, I have thus completely cured several cases of small bronchiectasis of young persons. The second method consists in the washing out of the bronchial tree with 40% Iodipin as brought into popularity through bronchography. These fillings too doubtless have their own value. Thus I know several patients who have such a filling made every year or twice a year, because the unpleasant breath and a larger amount of sputum make themselves evident after these intervals. With this intermittent treatment, however they feel very well and are completely fit for work and practically without complaints.

Strophanthin the Heart Stimulant

By Edward E. Cornwall,

M.D., F.A.C.P.

Strophanthin qualifies as a heart stimulant under the definition which describes a heart stimulant as an agent which by direct contact increases myocardial contractility and tonicity.

Strophanthin has been classed as a "digitalis body" and the assertion made that its physiological action in the human body is like that of digitalis, but it would seem that the two drugs differ notably in their actions. Digi-

talis produces a large part of its physiological effect by stimulation of the vagus inhibitory mechanism, and does not appear directly to increase myocardial contractility and tonicity, at least in mammals. Thomas Lewis says: "To the heart digitalis is not tonic but powerfully hypnotic"; and Henri Vaquez says: "Physiologically speaking, digitalis is not a heart tonic, as it has been called." Strophanthin, on the other hand, appears to have no effect on the nervous mechanism controlling the heart, and it does directly increase myocardial contractility and tonicity; according to Cohen and Levy, it does not invert the T-wave of the electrocardiograph, which is a regular effect of digitalis; and in death from a lethal dose of strophanthin the heart has been found to be in systole, while in death from digitalis poisoning the heart has been found to be in diastole. The physiological actions of the two drugs seem to overlap distinctly only in depressing myocardial conductivity, and, possibly, in increasing myocardial excitability.

What is Strophanthin?

To the question, what is strophanthin, the statement that it is the active principle derived from plants of the genus strophanthus is not a sufficient answer. Tiffeneau says that "no question in pharmacodynamics is so confused and complex as that of the strophanthins." Twenty-eight varieties of the genus strophanthus are said to be known, of which a considerable number have been used as sources of strophanthin, and there is a plant not of the genus strophanthus which contains a glucoside practically identical with the strophanthin derived from a particular species of strophanthus; and the several strophanthins which have been described, while resembling each other in chemical constitution and physiological action sufficiently to be classed together, differ enough in intensity of action, that is, in dose, to prevent them from being freely interchangeable. There is no standard type of strophanthin.

The United States Pharmacopœia of 1926 defined strophanthin as a "glucoside or mixture of glucosides derived from *Strophanthus kombe*"; the British Therapeutic Codex of 1923 defined strophanthin in practically the same terms; and the French Codex of 1908 defined as official a crystalline strophanthin derived from *Strophanthus hispidus*. But the "mixture of glucosides" may contain varying amounts of crystalline and amorphous strophanthins; and the crystalline strophanthin of *Strophanthus hispidus*, according to Tiffeneau, does not exist in commerce; and a crystalline strophanthin derived from *Strophanthus kombe* appears to be purely a laboratory product

In spite of this confusion it is possible to clarify the subject somewhat by reducing to three representative types or varieties the strophanthins which are used to any considerable extent in medicine at present, *viz.*:

1. The *G-strophanthin of Thoms.* This is a crystalline strophanthin obtained from *Strophanthus gratus* by the method of Thoms. It is said to be identical with the glucoside derived from *Acocanthera ouabaio*, but Tiffeneau concluded "that the identity of the ouabain of *Strophanthus gratus* and that of *Acocanthera ouabaio* was not absolute." This strophanthin is used particularly in Germany.

2. The *Ouabain of Arnaud.* This is a crystalline strophanthin obtained from *Strophanthus gratus* but by a process different from that of Thoms. The name ouabain given to this strophanthin adds to the confusion of the nomenclature. It is used particularly in France.

3. *Amorphous K-strophanthin.* (Strophanthinum, U. S. P.) This is an

amorphous strophanthin derived from *Strophanthus kombe*, and is a mixture of glucosides which is not uniform. Strophanthins of this type are used particularly in the United States and in England.

The following statements have been made concerning the comparative toxicity of the different strophanthins :

The crystalline strophanthin isolated from *Strophanthus kombe* is said to be one and a half times as toxic as the amorphous K-strophanthin. In the United States Pharmacopœa of 1926 the statement is made that the G-strophanthin given intravenously is twice as strong as the official K-strophanthin given by the same route. Vaquez says that the ouabain of Thoms is more toxic than the ouabain of Arnaud, which is derived from the same plant, and that the latter "is of no greater toxicity than the amorphous strophanthins."

Attempts have been made to standardize the strophanthins on the basis of the crystalline G-strophanthin. Vaques considered the ouabain of Arnaud to be a definite, stable product. The amorphous K-strophanthins have been standardized physiologically by determining the minimum lethal dose for a given weight of frog.

Physiological Action of Strophanthin.

Vaquez says: "Strophanthus is above all a heart poison, on which organ it has a remarkable action. Soon after the administration of a lethal dose the heart beats more slowly, the ventricles contract more and more, their output diminishes and death ensues when the heart, rigid, contracted and empty of blood, stops on account of excess of function. The influence is exerted first on the ventricles; the auricles resist longer. Finally it has been proved that the arrow poison acts on the myocardium itself, and not on the nerve filaments. The arrest of the heart does not depend either on the intervention of the pneumogastric or the medulla or cord . . . Strophanthus, then, is the heart medicine *par excellence*, the effects of which are exerted exclusively on the myocardium without intervention of any other factor. Perhaps it affects conductivity also, as Jameson has suggested, by lengthening the conduction time. . . . The elimination of strophanthus is more rapid than that of digitalis, but it is not known how it occurs. At all events, the substance is not evacuated by the kidneys, nor the salivary glands, nor by the alimentary tract, and on account of its rapid disappearance it has not a cumulative effect." Vaquez also says that strophanthin becomes "fixed in the myocardium after the manner of a stain or a toxin," and that "the fibres react more easily to the contraction owing to the fact that the myocardial tonicity has returned to the normal."

Hare says that strophanthus acts as a stimulant to the heart muscle but does not slow the heart by an action on the vagus.

The favourable effects which have been observed to follow the therapeutic use of strophanthin in auricular fibrillation and the bad results which have been observed to follow its administration immediately after digitalization, indicate that it diminishes conductivity.

The action of strophanthus on the musculature of the blood vessels might be inferred from its action on the cardiac musculature, allowance being made for the difference in anatomical arrangement. We would expect that its action on the comparatively thin vascular musculature would be less pronounced or less evident than on the massive concentration of functionally specialized muscular tissue in the heart.

Strophanthin in large or long continued doses may produce gastro-

intesitinal disturbances, *viz.*, anorexia, nausea, vomiting and diarrhœa. Loss of appetite developing suddenly during strophanthin medication suggests the advisability of lessening the dose or discontinuing the drug. A small proportion of individuals appear to have an idiosyncrasy regarding strophanthin, and in such individuals gastro-intestinal symptoms may appear after administration of comparatively small doses.

ADMINISTRATION OF STROPHANTHIN.

Since strophanthin acts directly on the cardiac tissues, and since it appears to be largely spent in its action, not apparently being recoverable in the body excretions, the importance of getting it to its anatomic therapeutic destination by the easiest routes and with least loss of substance is obvious. When given by mouth and exposed to the vicissitudes of a sojourn in the stomach and to absorption through an extensive mucous surface, the portion of the dose which succeeds in reaching the myocardium is necessarily small and uncertain. Strophanthin, therefore, should never be given by mouth to be swallowed. The available routes are the intravenous, the intramuscular, the hypodermic and the sublingual. The intravenous route is the most direct, and the one to be preferred in grave emergencies. The other routes, however, have been found by experience to be practicable. In most cases where large or moderately large doses are required, the hypodermic route is to be preferred. In cases where small or moderate doses are required the sublingual route may suffice. That the sublingual method of administration is an effective one has been demonstrated to the writer's satisfaction in an extensive experience. A considerable portion of the dose seems to be readily absorbed through the limited area of sublingual mucous membrane into the closely subjacent blood vessels.

It has been objected that strophanthin administered hypodermically causes local irritation. The writer's experience inclines him to the opinion that this objection has been overemphasized. By making the solution of the drug used in the injection comparatively dilute the local irritation can be lessened.

DOSAGE OF STROPHANTHIN.

In dealing with the dosage of strophanthin a difficulty is met with at the outset in the fact that strophanthin is not a substance of uniform quality. The name strophanthin does not necessarily always mean the same thing. To obviate this difficulty the writer regularly uses one preparation with whose dosage he has familiarized himself, *viz.*, a preparation of amorphous K-strophanthin which conforms to the requirements of the United States Pharmacopœia and is physiologically standardized.

Since strophanthin is given for symptomatic effect and not for a specific purpose, it follows that the dose should be graduated to suit the degree of functional deficit present. The doses which the writer has adopted as a result of experience are in most cases considerably smaller than those recommended in the text books. The large doses of the text books would seem to find their excuse in the common belief that strophanthin acts like digitalis and therefore should regularly be given in full doses for a specific effect. The general use of the large doses may also, perhaps, be responsible for some of the bad results which have been observed after administration of strophanthin, and for the failure of the drug to become generally known and appreciated. The writer considers it a fundamental principle in the therapeutic use of strophanthin always to give the smallest dose which will serve the purpose.

The range of dosage of the preparation of amorphous K-strophanthin

which the writer uses is from 1/1000 of a grain to 1/100 of a grain. The dose of 1/1000 of a grain is considered small, and is given sublingually from three to six times a day. The dose of 1/500 of a grain is considered full, and is given from two to six times a day, sublingually or hypodermically; by the former method in the milder cases, and by the latter method in the severer ones. The dose of 1/250 of a grain is considered large, and is given hypodermically, intramuscularly or intravenously, and not repeated more than once or twice in twenty-four hours. The dose of 1/100 of a grain is considered very large, and is given hypodermically, intramuscularly or intravenously, and is not repeated within twenty-four hours. It is rarely that the last mentioned dose is called for.

Therapeutic Uses of Strophanthin.

More than in the case of most symptomatic drugs are the uses of strophanthin suggested by its physiological action. Being a heart stimulant in the strict sense of acting by direct contact to increase myocardial contractility and tonicity, its use is indicated in heart failure due to myocardial insufficiency which is of too great a degree to be satisfactorily treated by regulation of physical activities and diet. In the treatment of the heart failure due to the arrhythmic impediment of auricular fibrillation or flutter it is also effective, but generally not so effective as digitalis, except in the cases with much myocardial degeneration and notable dilatation of the cardiac chambers. In such cases direct stimulation of contractility and tonicity by strophanthin is called for. Strophanthin can be used before digitalis in these cases, or with it, or by itself throughout. In advanced cases of myocardial failure with auricular fibrillation strophanthin may produce improvement when digitalis fails.

In walking cases of fatty or fibroid degeneration of the heart with only moderate shortness of breath on exertion, and little or no edema, the dose of 1/1000 of a grain, given sublingually three or four times a day, may be appropriate. In the more advanced cases which are still ambulant, doses of 1/500 of a grain given sublingually three or four times a day may be appropriate. In the severer cases which are confined completely or largely to bed, the dose of 1/500 of a grain given three to six times a day, sublingually or hypodermically, according to the severity of the case, may be appropriate. When this dosage is given hypodermically for any considerable length of time, the patient should be closely watched for toxic symptoms. While the dose of 1/500 of a grain may be given hypodermically every four hours for a considerable time in many cases with safety, it can in some cases produce toxic symptoms in a comparatively short time. In the very severe cases of myocardial failure the dose of 1/250 of a grain, given hypodermically, intramuscularly or intravenously and perhaps repeated once or twice at four or six hour intervals, may be appropriate. This dose, if continued, soon brings on toxic symptoms. In grave emergencies, as in acute dilatation, a single dose of 1/100 of a grain may be given; but it is rarely that the emergency dose need exceed 1/250 of a grain. In conditions of heart failure occurring in the acute infections, as typhoid fever and pneumonia, the doses above indicated can be used. Strophanthin may also be indicated in the failing hypertensive heart, and in heart failure from acute cardiac overstrain.

Strophanthin has such a wide field of usefulness as a direct heart stimulant in heart failure, and is so very effective, that it seems well to deserve the epithet applied to it by Vaquez, of "*heart medicine par excellence.*"

Long Island Medical Times—August 1932.

ASSOCIATION NOTES.

Tanuku Medical Association.

Dr. N. Rama Rao, L.M.P., the Secretary of the Association reports that the Second Anniversary was celebrated on the 2nd October 1932 at the local Town Hall when a large number of practitioners of West Godavari was present. A number of papers of medical interest were read at the meeting and the annual report for 1931 was presented. The total receipts for the year were Rs. 147-5-9 and expenditure Rs. 142-7-3 of which Rs. 113-4-0 were spent on Journals.

Report of the working of the South Kanara District Medical Association for the year ending 30-6-1932.

The Association has finished its second year of existence. The year has been one of quiet and steady progress.

Membership.—The year started with a membership of 41 on the rolls of which 23 were resident and 18 non-resident members. Seven resident members resigned and one, Dr. B. Ishwaryya died during the year, thus totalling the removals to 8. The Association records with regret the loss of its First President Lt.-Col. D. G. Rai, I.M.S., by death. The new admissions were seven and one rejoined thus making up 8. Three non-resident members joined during the year Thus the membership on the rolls at the end of the year was 23 resident and 21 non-resident, totalling 44.

Finance.—The usual membership fee Re. 1 per month for resident, ank Rs. 2 per half year for non-resident members, was collected. Out of a total demand of Rs. 443-12 0, including last year's outstanding Rs. 325, were collected leaving a balance of Rs. 118-12-0 for realisation. Under Bye-law 18 the dues from members who resigned were written off. The Association thanks Dr. K. Pothan for his kind donation of Rs. 5, as he could not become a member owing to his short stay. The total receipts come to Rs. 564-8-8, including last year's balance of Rs. 122-15-8, and after an expenditure of Rs. 372-13-11, there is a balance of Rs. 191-10-9. Out of this a sum of Rs. 60, has been invested under Bye-law 7 being the Entrance Fees and donations collected. It is hoped that outstandings will be collected ere long.

Meetings.—The Association held 12 meetings during the year under report including the Annual General Meeting. Two were for bidding farewell to two popular members Major N. M. Mehta, I.M.S., the retiring President, and Dr. R. Ganapathi Iyer on the eve of their transfer. At one of the meetings the newly elected Chairman and municipal councillors who are members of the Association and a member who was made an Honorary Magistrate were congratulated. At one a President was elected in place of Major N. M. Mehta, one was a condolence meeting for the loss of Lt.-Col. D. G. Rai and Dr. B. Ishwarayya. The Indian Medical Council Bill and Honoraries Report were discussed at one meeting. A Conference of Medical Inspectors was called and the question of Medical inspection was considered at one meeting. The rest were Clinical meetings. Thus the activities of the Association were varied. The Committee offers its thanks to the members who offered tea at various meetings and to the lecturers.

Management.—Major N. M. Mehta I.M.S., the President at the beginning of the year resigned due to his transfer. Dr. B. Ishwarayya was elected President in August 1931. At the Annual General Meeting Dr. M. Shiva Rao was elected President. The Honorary Secretary and Treasurer was

re-elected for the year. In the Executive Committee Drs. K. Giridhar Rao and C. P. Kamath were elected in place of Drs. L. P. Fernandez and U. P. Mallya. The Executive Committee tackled all questions and placed its views before the general body.

Journals.—During the year seven Journals were got for the Association.

The Journals have been circulated locally. The difficulty of circulating to non-resident members has not been fully solved. Moreover a few journals sent have not as yet been received. Some Journals have been returned without being circulated to all. To overcome this difficulty a new suggestion has been made and it is hoped that this arrangement will work satisfactorily. Some members have made their own arrangement for getting the Journals.

Member's Activities.—Six members of the Association *viz.*, Drs. K. Vittal Shetty, U. P. Mallya, S. S. Hegde, H. V. Adappa, A. F. Coelho and U. N. Nayak, were elected to the Municipal Council, the first four unopposed and the last two after a strenuous fight at the polls. Dr. K. Vittal Shetty was elected the Chairman of the Council by an overwhelming majority. Dr. K. Girdhar Rao was nominated as Honorary Magistrate. The Association feels proud on the success of its members at the polls, and offers its congratulations to the recepients of those honours. The Association is certain that the presence of its members in the Council will be a great asset to the civic administration of our town.

Habitation.—The Association offers its thanks to the Government of Madras, for kindly allowing the use of the Headquarters Hospital and the Lady Goschen Hospital for the activities of the Association. It is with great pleasure that we record our grateful thanks to the District Medical Officer and his staff, for the uniform kindness, help and courtesy to the Association during the year in its work despite all personal inconvienence to them. It is hoped that the Association will have a habitation of its own early.

Conclusion.—The work done during the second year of this infant Association has been unostentatious and steady. The Committee takes this opportunity of thanking one and all for their kind co-operation and encouragement. As the suggestion of a non-resident member the idea of starting branches in the mofussil will be taken up, and suitable alterations in the Bye-laws will be placed before you. This it is hoped will add to the popularity of the Association and will give added interest to the members of the profession who have not yet joined. The achievement has been very little and much remains to be done. With the steady co-operation of the profession the Association will serve its purpose ere long.

REVIEWS.

The Madras Medical Directory.

We have received a copy of the above book published by Mr. T. S. Lakshmipathy. It is a " Who is Who " of some of the more prominent doctors practising in the city and also includes a list of the doctors practising here with their addresses. It also contains a list of hospitals and manufacturing and wholesale chemists. A history of the Government General Hospital is also given. It is the first publication of its kind and will be found useful. It is priced one rupee and is available at the Medical Co-operative Society Ltd., 246, Thambu Chetty Street, Madras.